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* KEY ISSUES: CONFISCATION
*             FIRST WELL
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* FINAL ORDER: PARTIAL GRANT
*              PARTIAL DENIAL
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RULE 37 CASE NO. 106,328

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APPLICATION OF 1988 INDEXGEO - J.V., & MARQUEE CORPORATION FOR AN  
 EXCEPTION TO STATEWIDE RULE 37 FOR ITS JOHNSTON LEASE, WELL NO. 1, IN THE  
 WILDCAT, WEBER, NE (3650), WEBER, N.E. (3730), WEBER, NE (3935), AND WEBER NE  
 ( 4 0 0 0 ) F I E L D S , V I C T O R I A C O U N T Y , T E X A S

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APPEARANCES:

For Applicant:

David L. Nelson, attorney	1988 Indexgeo - J.V., & Marquee
Robert J. Maurer	Corporation
Charles C. Leung	

For Protestant:

Protestant:

William E. Black, attorney	Harken Exploration Company
Maynard N. Little	
Dale E. Miller	

PROCEDURAL HISTORY

Date of Hearing Notice: November 21, 1989

Date of Hearing: January 24, 1990

Status: Protested

HEARD BY:

Barbara Epstein, Hearings Examiner  
 David C. Triana, P.E., Technical Examiner

## PROPOSAL FOR DECISION

### STATEMENT OF THE CASE

This is the application of 1988 Indexgeo - J.V., & Marquee Robert J. Maurer Corporation, hereinafter referred to as Indexgeo, for an exception to Statewide Rule 37 to drill its Johnston Lease Well No. 1 in the Wildcat, Weber, NE (3650), Weber, N.E. (3730), Weber, NE (3935), and Weber NE (4000) Fields, Victoria County, Texas. The proposed well will be located 100' from the southeast lease line, while field rules require 467' feet spacing from lease lines. This application is protested by Harken Exploration Company, hereinafter referred to as Harken, on the grounds that a well drilled at a regular location would provide the applicant an opportunity to recover its share of the hydrocarbons underlying its tract.

### APPLICANT'S EVIDENCE

Indexgeo characterized the depositional nature of the targeted Frio Sands of this application as Gulf Coast lenticular and stratigraphic sands. The area of the requested fields reflects a varied depositional environment of bar, channel, and thin blanket sands. Based on the available well logs surrounding the proposed location, Indexgeo developed a structural/sand thickness interpretation of the primary target sand, that being the 3730' sand. The interpretation presented by applicant's witness indicates the 3730' sand body to present a southwest-northeast strike with dip being to the southeast. The 3730' sand thins and pinches out along dip to the north of applicant's proposed location. The 3730' sand is not found to the west of the proposed location indicating a thinning or non-deposition to the west along strike. Although the 3730' sand is found to occur to the east of the proposed location in the Vanderbilt J. Welder No. 1 and Wiseman W. Murphy Well No. 1, these wells encountered the sand below a gas-water contact found at approximately -3585 subsea. Based on maximum shale content of 30% or less, the J. Welder and W. Murphy wells are interpreted by applicant to have encountered 18 feet and 27 feet of clean Frio sand in the 3730' sand field. In comparison, the protestant's Harken Welder Well No. 1 encountered 26 feet of clean Frio sand in the correlative 3730' sand interval. West of the proposed location the Groll Well No. 1 encountered 5 feet of Frio sand and the Tagliabue Well No. 1 lacked deposition of the 3730' sand.

Under cross-examination, Indexgeo stated that movement of the proposed location toward a regular location would be movement up regional dip with a corresponding loss of sand thickness and reservoir quality. Furthermore, movement toward a regular location would be movement away from the area of the reservoir indicated to be water bearing. Although water bearing, Indexgeo could not definitively conclude whether the reservoir drive mechanism was a depletion drive, water drive, or some combination thereof. In addition, based on the available data, Indexgeo could not definitively conclude whether the depositional model of the primary targeted Frio sand was a channel sand body or an offshore marine bar. The witness did emphasize the thinning and loss of reservoir quality with movement updip of the proposed location and further estimated that the reservoir thickness at the proposed location would be less than the 26 feet of sand encountered at the Harken Well and equal to or greater

than the 5 feet of clean sand encountered by the Groll Well No. 1.

Indexgeo employed orthogonal lines of seismic to develop a gas bearing sand or bright spot interpretation of the 3730' sand at the proposed location. The analysis employed two seismic lines along strike and a single dip seismic line. The bright spot interpretation of applicant's witness focused on a seismic event at approximately 1.00 microseconds of transit time or approximately -3500 feet subsea. The bright spot as delineated by Mr. Leung (Exhibit No. 1) represents a maximum limit of the potential gas bearing sand. The actual extent of the gas charged sand is believed to be as much as 250 feet less than the indicated maximum limit due to the inherent inaccuracies of seismic data acquisition and interpretation. Within the limits of this accuracy of bright spot interpretation, a maximum lease line location based on this interpretation was placed at 210 feet from the lease line. The witness further stated that a regular location at 467 feet from the lease line was beyond the accuracy of the signature of the recognized bright spot and the drilling of such a location would represent an increased risk of encountering the 3730' sand as non productive.

Indexgeo also stated that another well would not be drilled to test the Wildcat zone.

#### PROTESTANT'S EVIDENCE

Harken employed available well log data to construct a base of structure map for the primary target of the 3730' sand. Net clean sand picks of thickness of the productive 3730' sand were then employed to construct an isopach map of the 3730' sand. The isopach was then superimposed over the base of structure for the 3730' sand to construct an apparent top of structure map for the 3730' sand. Further imposing the gas-water contact recognized from available well data, a net pay map of the 3730' sand was constructed and presented by Mr. Maynard (Harken Exhibit No. 8).

Harken's interpretation of the Frio sand of the 3730' sand is that of a dip oriented channel sand of increasing sand thickness at a regular location updip of applicant's proposed location. Based on protestant's net pay interpretation, a legal or regular location north of applicant's proposed location would encounter approximately 35 feet of Frio sand in the 3730' sand correlative interval.

Harken presented a bright spot interpretation based on reprocessed seismic employing dip moveout (DMO) reprocessing of the available dip oriented seismic line. The DMO reprocessing of the existing dip seismic line indicates that the bright spot may extend beyond a 467' lease line regular location at shotpoint 261½ of the seismic line. Harken presented a reprocessed stacking of seismic data at the location of the Harken Exploration J. Welder Well No. 1, the proposed Indexgeo Johnston Well No. 1 and a regular location 467 feet from the Johnston lease line. The presentation was that of an amplitude versus offset stacking (AVO) of the seismic data which was employed to determine the presence of a gas charge at the depth of the seismic event of 1.00 microseconds. AVO processing serves as a confirmation of the existence of a bright spot within the available seismic data. Mr. Maynard concluded that there is indication of a gas charge within

the 3730' sand equal to that of the Harken J. Welder Well No. 1 at a regular location for 467' from applicant's lease line.

On cross-examination, Harken acknowledged the break-up of the trough above the seismic bright spot on the reprocessed seismic line at approximately shot point 259 or approximately 200 feet removed from applicant's lease line. In addition, Harken acknowledged a lack of well control to the north-northeast of applicant's proposed location and stated that contour discipline was the basis for the 40 foot contour thickness indicated on protestant's net pay isopachous map. Under cross-examination, Harken continued to maintain that the 3730' sand body is a dip oriented channel sand.

Harken presented a calculation of gas-in-place for the Indexgeo Johnston Lease and the Harken Welder Lease. A volumetric content calculation was first prepared based on available reservoir data obtained from the completion of the Harken Welder Well No. 1. Mr. Miller calculated a volumetric content of 948.98 MSCF per acre foot of 3730' sand reservoir. Employing the net pay map of the 3730' sand Harken planimetered 1665 acre-feet of sand for the J. Welder Lease and 1709 feet of sand for the Johnston Lease. Applying the volumetric content calculation, the gas-in-place for the J. Welder Lease is calculated to be 1.58 bcf versus 1.62 bcf for the Johnston Lease.

Under cross-examination, Harken stated that the only reservoir performance data available to date is the initial reservoir pressure for the J. Welder Well No. 1. Production performance is not available to verify the reservoir productive mechanism as a water drive or depletion drive mechanism. The Harken Welder Well No. 1 has been shut-in to date due to a lack of a pipeline connection. Furthermore, even if the reservoir produces under a water drive mechanism, the location of the applicant's well is of no consequence to protestant as the gas updip of the Harken Welder Well No. 1 will migrate to applicant's well as a result of the water drive.

In rebuttal of the AVO seismic processing presented by Harken, Indexgeo stated that the near-far phone stacking presented by applicant's geophysicist was highly influenced by noise in the seismic data as the farthest phones were at the limit of the accuracy of the reprocessed seismic data employed in the AVO reprocessing presentation.

#### EXAMINERS' OPINION

The examiners believe that the proposed exception to Statewide Rule 37 for a first well on the Johnston Lease should be granted for the Weber N.E. (3730) and Wildcat Fields to prevent confiscation. It is the examiners' opinion that the proposed location is reasonable based on the seismic interpretation presented by Indexgeo and that no other location will provide the applicant an opportunity to recover its share of hydrocarbons underlying the tract, or indeed that another location would result in a productive well.

The geologic evidence with regard to the depositional nature of the 3730' sand is less

supportive of protestant's interpretation of a dip oriented channel sand than applicant's interpretation is of a strike oriented bar sand. Furthermore, the net sand isopach prepared by protestant is not supported in the area north and northeast of applicant's proposed location by the available well control. The presentation of applicant of a sand body increasing in thickness to as much as 40 feet updip to the north-northeast of applicant's proposed location represents in the examiners' opinions a liberal application of contour discipline based on the available wellbore data.

The bright spot interpretation of gas charged sand as presented by applicant's geophysicist follows well from the seismic data base and the recognized inherent inaccuracies of the data. Following the definition of a bright spot as presented to the examiners and as found in industry literature, the bounding troughs bordering the bright spot peaks of protestant's DMO reprocessed seismic interpretation do exhibit a breakup in the trough line below shot point 259. This raises a question of whether the bright spot gas charged sand is continuous to the point of a regular location 467 feet from applicant's lease line. This tends to confirm the opinion of applicant's geophysicist that movement updip to a regular location in the 3730' sand increases the risk of drilling a non-productive location in the subject sand.

The examiners agree with the conclusions of protestant's engineering witness on cross-examination that there is insufficient data to date to define the productive mechanism of the 3730' sand. Furthermore, if the sand does produce by means of a water drive mechanism, the location of applicant's well with respect to the lease line will be of little consequence to the ultimate recovery from the Harken Welder Well No. 1 as all gas remaining updip will be swept to the Johnston Well No. 1 when the Welder Well No. 1 waters out. The balancing of equities between the two wells under a depletion drive mechanism if one should exist in this field, will be accomplished through the efforts of the individual operators to assure the proper functioning of the allocation formula adopted for this field.

Due to applicant's failure to present evidence in support of any fields except the Wildcat and 3730' sand, the examiners recommend the denial of all other applied-for fields.

Based on the testimony presented at the hearing and the evidence admitted into the record, the examiners make the following findings of fact and conclusions of law.

#### FINDINGS OF FACT

1. At least ten (10) days notice was given to all affected adjacent lessees and/or mineral interest owner(s) of each adjacent tract.
2. The field rules for the applied-for fields are as follows:

Wildcat 467'/1200/40 ac.

Weber, NE (3650) 467'/1200/40 ac.

Weber, N.E. (3730) 467'/1200/40 ac.

Weber, NE (3935) 467'/1200/40 ac.

Weber NE (4000) 467'/1200/40 ac.

3. An exception to Statewide Rule 37 for the Johnston Well No. 1 for the applied-for fields is necessary because the proposed well will be located 100' from the southeast lease line.
4. This application is protested by Harken Exploration Company.
5. The target zone for the Indexgeo Johnston No. 1 is the Weber NE (3730) Sand.
6. The geology of the Johnston Lease is characterized by lenticular stratigraphic sand deposits.
7. The proposed location for the Weber N.E. (3730) Field is reasonable because it provides the best opportunity to make a productive well on the Johnston Lease, based on Indexgeo's seismic study of the vicinity.
8. The proposed Rule 37 exception for the Weber N.E. (3730) Field will provide the applicant a reasonable opportunity to recover its share of hydrocarbons underlying the subject tract to which it is entitled.
9. 1988 Indexgeo - J.V., & Marquee Robert J. Maurer Corporation will not drill another well to test the Wildcat Field.

#### CONCLUSIONS OF LAW

1. A Railroad Commission W-1 application was properly filed by the applicant.
2. Proper notice was issued by the Railroad Commission to appropriate persons legally entitled to notice.
3. All things have been done or have occurred to give the Railroad Commission jurisdiction to decide this matter.
4. An exception to Statewide Rule 37 must be obtained before a well can be drilled at the applied-for location for the applied-for fields.
5. The proposed well is necessary to afford the applicant, 1988 Indexgeo - J.V., & Marquee Robert J. Maurer Corporation, a reasonable opportunity to recover its share of hydrocarbons underlying the subject tract in the Weber N.E. (370) and Wildcat Fields,

thereby preventing confiscation.

6. 1988 Indexgeo - J.V., & Marquee Robert J. Maurer Corporation failed to prove that an exception to Statewide Rule 37 for the Johnston Well No. 1 for the Weber, NE (3935), and Weber NE (4000) Fields is necessary to prevent confiscation.

#### EXAMINERS' RECOMMENDATION

The examiners recommend that the above findings and conclusions be adopted and that this exception to Statewide Rule 37 be granted for the Weber, N.E., (3730) and Wildcat Fields.

Respectfully submitted,

Barbara Epstein  
Hearings Examiner

David C. Triana, P.E.  
Technical Examiner